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Education

B.S. Tulane University, 1975 (Chemical Engineering)
M.S. Texas A&M University, 1979 (Oceanography)
Ph.D. University of South Florida, 1985 (Marine Science)

Professional Experience

July 1991 to present, Research Chemist, Ecosystems Research Division (ERD), National Exposure Research Laboratory (NERL), U.S. Environmental Protection Agency (USEPA), Athens, GA

March 2011 to July 2011 (120 day detail), Acting Chief, Ecosystems Assessment Branch (EAB), ERD, NERL, USEPA, Athens, GA

February 1988 to July 1991, Assistant Research Scientist, Geochemical and Environmental Research Group, Department of Oceanography, Texas A&M University, College Station, TX

June 1985 to February 1988, Assistant in Research, Department of Marine Science, University of South Florida, St. Petersburg, FL

January 1980 to June 1985, Graduate Research Assistant, Department of Marine Science, University of South Florida, St. Petersburg, FL

September 1980 to May 1984, Adjunct Professor, Department of Science, St. Petersburg Junior College

August 1978 to December 1979, Graduate Research Assistant, Department of Oceanography, Texas A&M University, College Station, TX

August 1976 to August 1978, Graduate Teaching Assistant, Departments of Chemistry and Mathematics, Texas A&M University, College Station, TX

May 1975 to August 1976, Chemical Engineer, Exxon Co., USA, Southeastern Production Division, New Orleans, LA

EPA Project Officer Service

January, 2012 – present, RARE project with EPA Region 4 and Mississippi State University: “Improving TMDL and Waste Load Allocation Permit Limits by Determination and Application of New Sediment Diagenesis Input Parameters in Current Water Quality Models”.

March, 2003 - March 2004, Cooperative Agreement with Instituto de Investigaciones Oceanológicas (IIO) of the Universidad Autónoma de Baja California (UABC) in Ensenada, Baja California, Mexico: “ $^{13}\text{C}/^{12}\text{C}$ ratios of n-hydrocarbons, PAHs, and LABs from prominent point sources to the Southern California Bight”.

June, 1994 – June, 1995, Interagency Agreement (IAG) with the US Forest Service (USFS) Intermountain Fire Sciences Laboratory (IFSL): “Emissions of particulate matter and trace gases from kilns used for charcoal production”

June, 1993 – June, 1994, IAG with USFS/IFSL: “Emissions of particulate matter and trace gases from fires in tropical ecosystems of Africa”

Current Scientific Interests:

- Influence of land use on headwater stream structure and function
- Sustainability and recovery of terrestrial and aquatic ecosystems
 - Stressors/drivers
 - Poultry/cattle production-forest-residential in Georgia Piedmont
 - Mountaintop mining in Appalachia
 - Nutrient cycling in estuary, lake, and stream sediments
 - Tools/approaches
 - C, N, P, and O biogeochemical indicators in water and sediment
 - Variation across time, space, and hydrology
 - Stable isotopes
 - diffusive equilibrium in thin films (DET)/diffusive gradients in thin films (DGT)

Outside Professional Activities

- Adjunct Assistant Professor of Geology, University of Georgia (UGA), Athens, GA. Feb. 1995 - present. I have served on one M.S. in Geology advisory committee, one PhD in Geology advisory committee, and one PhD in Ecology advisory committee.
- I have also served on one MS in Oceanography advisory committee and one PhD in Oceanography advisory committee at Instituto de Investigaciones Oceanológicas (IIO) of the Universidad Autónoma de Baja California (UABC) in Ensenada, Baja California, Mexico.
- Member, American Geophysical Union, 1979 – 2012.
- Member, Soil Science Society of America, 1997 – 2004.

- Co-organizer (with R. Zepp) of several sessions dealing with ecosystem/atmosphere exchange of trace gases at the 1993 National Fall Meeting of the American Geophysical Union, San Francisco, CA.
- Member, Boreal Ecosystem Atmosphere Study (BOREAS) Science Team, 1993 - 1997.
- Member, Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Science Team, 1998 - 2006.
- Associate Editor, Journal of Environmental Quality 2000 - 2003.
- Member of the Candidate Evaluation Panel for selection of the Research Leader at the USDA J. Phil Campbell, Sr., Natural Resource Conservation Center, Watkinsville, GA, 2002.
- Organizer of the symposium: “Stable Isotopes in Agriculturally Impacted Watersheds” at the 2003 Soil Science Society of America Annual Meeting, Denver, CO.

Service as a Mentor or Advisor

- Ms. Karen Birkhead, UGA undergraduate student (Biology), technician on National Institute for Global Environmental Change (NIGEC) grant 1992 - 1993, NNEMS Fellow 1993-1994
- Ms. Marie Pagan, EPA/CEIP Minority Summer Internship Program Intern, Jun – Aug 1993
- Ms. Jennifer M. Cruse, UGA graduate student (Botany), technician on NIGEC grant, 1993 - 1995
- Mr. John R. Tinsley, UGA graduate student (Geology), NNEMS Fellow 1993 -1994, member of his Master’s thesis committee, 1993-1996, MS awarded.
- Mr. Billy Pournaras, UGA undergraduate student (Biology), NNEMS Fellow 1994 -1995.
- Dr. Vincent P. O’Malley, National Research Council (NRC) Postdoctoral Associate 1994 -1996
- Ms. Marie Pagan, M.S., Oak Ridge Institute for Science and Education (ORISE) Fellow 1995 - 1997
- Ms. Qing Yang, B.S., ORISE Fellow 1995 - 1996.
- Dr. Marirosa Molina, UGA graduate student (Ecology), member of her PhD committee 1996 - 2001, PhD awarded.
- Ms. Julia Cox, M.S., Term Federal Physical Science Technician 1997 - 2000.
- Dr. Laurie J. Osher, NRC Postdoctoral Associate 1998 - 1999.
- Dr. Jon Molinero, NRC Postdoctoral Associate 2001 - 2004.
- Mr. James Sullivan, UGA graduate student (Marine Sciences) NNEMS Fellow 2001-2002
- Ms. Adrienne Monzingo, Institute of Tribal Environmental Professionals (ITEP) Summer Internship Program Intern, June – August 2001
- Dr. Nancy Ramirez Alvarez, graduate student, IIO/UABC, member of her PhD committee, 2002-2008, PhD awarded
- Dr. Karel Castro Morales, IIO/UABC, member of her MS committee, 2003-2005, MS awarded

- Dr. Stevan Earl, NRC Postdoctoral Associate 2004 – 2005
- Ms. Stephanie Fulton, EPA Region 4 Ecologist, RRPP participant 2005- 2006
- Mr. Robert Dean Hardy, Student Services Authority (SSA) Contractor 2004-2006
- Ms. Brenda Kitchens, Environmental Scientist, NERL Mentoring Program participant, 2006-2007
- Ms. Jennifer Satterfield, SSA Contractor, 2006-2007
- Mr. Blake McCranie, SSA Contractor, 2007-2009
- Mr. Mark Stanley, SSA Contractor, 2007-2009
- Ms. Gayle Lennox, SSA Contractor, 2009-2010
- Ms. Morgan Hudson-Davis, SSA Contractor, 2010-2011
- Ms. Temitope Aiyejorun, SSA Contractor, 2010-present
- Dr. Katherine L. Schroer, UGA graduate student (Geology), member of her PhD committee, 2005- 2011, PhD awarded
- Mr. Robert Mckinley, MS, SSA Contractor, 2011-present

Awards

- 1985 John B. Lake Award for The Outstanding Graduate Student in the Marine Science Department, University of South Florida (cash award).
- 1993 USEPA Scientific and Technological Achievement Award (STAA), Honorable Mention for the paper published in *Chemosphere* 26: 55-67.
- 1997 USEPA STAA, Level II (with R. Zepp) for the paper published in *Jour. Geophys. Res.* 101: 23,699-23,706 (cash award).
- 1998 USEPA STAA, Level II (with R. Zepp) for the papers published in *Jour. Geophys. Res.* 102: 29,301-29,311, and *Jour. Geophys. Res.* 102: 29,289-29,300 (cash award).
- 1998 USEPA STAA, Level III, for the paper published in *Org. Geochem.* 27: 567-581 (cash award).
- 1999 USEPA STAA, Level III, for the paper published in *Jour. Geophys. Res.* 104:8161-8171 (cash award).
- 2000 USEPA Science Achievement Award for Earth Sciences with M. Molina
- 2003 USEPA Bronze Medal with R. Zepp and M. Molina
- 2004 USEPA STAA, Honorable Mention (with M. Molina and J. E. Cox), for the paper published in *Jour. Env. Qual.* 32: 198-206.
- 2010 NERL Special Achievement Award for “Addressing Science Needs in Headwater Streams Following Recent Federal Court Rulings” in support of “Goal 1 – Support the Agency’s Mission” with Brent Johnson and Ken Fritz
- 20 other EPA cash awards; 7 team awards, 13 individual awards, and one quality step increase (QSI)

Review Activities

I have served as a reviewer for the following journals:

Organic Geochemistry
Geochimica et Cosmochimica Acta
Soil Science Society of America Journal
Limnology and Oceanography
Biogeochemistry
Vibrational Spectroscopy
Journal of Geophysical Research
Continental Shelf Research
Global Biogeochemical Cycles
Chemosphere
Estuarine and Coastal Shelf Science
Journal of Environmental Quality

I have reviewed proposals for the following funding organizations:

US Geological Survey
National Oceanic and Atmospheric Administration
USEPA
US Department of Energy
US Civilian Research and Development Foundation
National Aeronautics and Space Administration
Marsden Fund of the Royal Society of New Zealand
United Kingdom Natural Environment Research Council

Publications – My publications had been cited a total of 920 times as of August 2011 based on data obtained from the Web of Science and/or Google Scholar. Seventeen of these papers have been cited at least 20 times as indicated below.

Peer-reviewed Scientific Journal Papers

1. Burke, R.A., J.M. Brooks and W. M. Sackett, 1981. Light hydrocarbons in Red Sea brines and sediments. *Geochim. Cosmochim. Acta* 45, 627-634. (20 citations)
2. Brooks, J.M., D.A. Wiesenburg, R.A. Burke and M.C. Kennicutt, 1981. Gaseous and volatile hydrocarbon inputs from a subsurface oil spill in the Gulf of Mexico. *Environ. Sci. Tech.* 15, 951-959.
3. Wiesenburg, D.A., J.M. Brooks and R.A. Burke, 1982. Gaseous hydrocarbons around an active offshore gas and oil field *Environ. Sci. Tech.* 16, 278-282.
4. Burke, R.A., D.F. Reid, J.M. Brooks and D.M. Lavoie, 1983. Upper water column methane geochemistry in the eastern Tropical North Pacific. *Limnol. Oceanogr.* 28, 19-32. (46 citations)
5. Burke, R.A., C. S. Martens, and W. M. Sackett, 1988. Seasonal variations of D/H and

$^{13}\text{C}/^{12}\text{C}$ ratios of microbial methane in surface sediments. *Nature* 332, 829-831. (43 citations)

6. Burke, R. A., T. R. Barber, and W. M. Sackett, 1988. Methane flux and stable hydrogen and carbon isotopic composition of sedimentary methane from the Florida Everglades. *Global Biogeochemical Cycles* 2: 329-340. (48 citations) **invited**
7. Barber, T. R., R.A. Burke, and W.M. Sackett, 1988. Diffusive flux of methane from warm wetlands. *Global Biogeochemical Cycles* 2: 411-425. (36 citations) **invited**
8. MacDonald, I.R., W.R. Callender, R.A. Burke, S.J. McDonald and R.S. Carney, 1990. Fine-scale distribution of methanotrophic mussels at a Louisiana cold seep. *Prog. in Oceanogr.* 24: 15-24. (39 citations)
9. Brooks, J.M., D.A. Wiesenburg, H. Roberts, R.S. Carney, I.R. MacDonald, C.R. Fisher, N.L. Guinasso, W.W. Sager, S.J. McDonald, R.A. Burke, and T.J. Bright, 1990. Salt, seeps and symbiosis in the Gulf of Mexico: A preliminary report of deep water discoveries using DSV ALVIN. *EOS* 71: 1772-1773. (34 citations)
10. Dando, P.R., M. Austen, R.A. Burke, M.A. Kendall, M.C. Kennicutt II, A.G. Judd, D.C. Moore, S.C.M. O'Hara, R. Schmaljohan, and A.J. Southward, 1991. The ecology of a North Sea pockmark with an active methane seep. *Marine Ecol. Prog. Ser.* 70: 49-63. (98 citations)
11. Burke, R.A., T.R. Barber and W.M. Sackett, 1992. Seasonal variations of stable hydrogen and carbon isotope ratios of methane in subtropical freshwater sediments. *Global Biogeochemical Cycles* 6: 125-138.
12. Jensen, P., I. Aagaard, R.A. Burke, P.R. Dando, N.O. Jørgensen, A. Kuijpers, T. Laier, S.C.M. O'Hara, and R. Schmaljohann, 1992. 'Bubbling reefs' in the Kattegat: submarine landscapes of carbonate-cemented rocks support a diverse ecosystem at methane seeps. *Marine Ecology Progress Series* 83: 103-112. (60 citations)
13. Kennicutt, M.C., R.A. Burke, I.R. MacDonald, J.M. Brooks, G.J. Denoux, and S.A. Macko, 1992. Stable isotope partitioning in seep and vent organisms: Chemical and ecological significance. *Chemical Geology (Isotope Geoscience Section)* 101: 293-310. (58 citations)
14. Withrow, D., R. Burke, L. Jones, and J. Brooks, 1992. Variations in $\delta^{13}\text{C}$ carbon isotope ratios in Bowhead Whale baleen plates used to estimate age. *Rept. Int. Whal. Commn.* 42: 469-473.
15. Burke, R. A., 1993. Possible influence of hydrogen concentration on microbial methane stable hydrogen isotopic composition. *Chemosphere* 26: 55-67. (32 citations)

16. Hovland, M., A.G. Judd, and R. A. Burke, 1993. The global flux of methane from shallow submarine sediments. *Chemosphere* 26: 559-578. (76 citations)
17. Fisher, C.R., J.M. Brooks, J.S. Vodenichar, J.M. Zande, J.J. Childress, and R.A. Burke, 1993. The co-occurrence of methanotrophic and chemoautotrophic sulfur-oxidizing bacterial symbionts in a deep-sea mussel. *P. S. Z. N. I. Marine Ecology* 14: 277-289. (65 citations)
18. Ambler, J.W., J. Alcala-Herrera, and R. A. Burke 1994. Trophic role of particle feeders and detritus in a mangrove island prop root ecosystem. *Hydrobiologia* 292/293: 437-446.
19. Zepp, R.G., W.L. Miller, R.A. Burke, D.A.B. Parsons, and M.C. Scholes, 1996. Effects of moisture and burning on soil-atmosphere exchange of trace carbon gases in a Southern African savanna. *Journal of Geophysical Research* 101: 23699-23706. (32 citations)
20. O'Malley, V.P., R.A. Burke, and W.S. Schlotzhaur, 1997. Using GC-MS/Combustion/IRMS to determine the $^{13}\text{C}/^{12}\text{C}$ ratios of individual hydrocarbons produced from the combustion of biomass materials-application to biomass burning. *Organic Geochemistry*, 27: 567-581. (43 citations)
21. Burke, R.A., R.G. Zepp, M.A. Tarr, W.L. Miller, and B.J. Stocks, 1997. Effect of fire on soil-atmosphere exchange of methane and carbon dioxide in a Canadian Boreal Forest. *Journal of Geophysical Research* 102: 29,289-29,300. (43 citations) **invited**
22. Zepp, R.G., W.L. Miller, M.A. Tarr, R.A. Burke, and B.J. Stocks, 1997. Soil-atmosphere fluxes of carbon monoxide during early stages of post-fire succession in upland Canadian boreal forests. *Journal of Geophysical Research* 102: 29,301-29,311.
23. Kuhlbusch, T. A., R. G. Zepp, W. L. Miller, and R. A. Burke, 1998. Carbon monoxide deposition velocities of different soil layers in upland Canadian boreal forests, *Tellus* 50B: 353-365.
24. Burke, R.A., J.L. Meyer, J.M. Cruse, K.M. Birkhead and M.J. Paul. 1999. Soil-Atmosphere exchange of methane in adjacent cultivated and floodplain forest soils. *Journal of Geophysical Research* 104(D7):8161-8171.
25. Pinto, A., M. Bustamante, K. Kisselle, R. Burke, R. Zepp, L.Viana, R. Varella, and M. Molina. 2002. Soil emissions of N_2O , NO , and CO_2 in soils of Brazilian savannas: Effects of vegetation type, seasonality and prescribed fires. *Journal of Geophysical Research* 107 (D20): 8089, doi: 10.1029/2001JD000342.
26. Kisselle, K. W., R. G. Zepp, R. A. Burke, A. S. Pinto, M. M. C. Bustamante, S. Opsahl, R. F. Varella, and L. T. Viana. 2002. Seasonal soil fluxes of carbon monoxide in burned and unburned Brazilian savannas. *Journal of Geophysical Research* 107 (D20): 8051, doi:10.1029/2001JD000638.

27. Burke, R. A., M. Molina, J. E. Cox, L. J. Osher, and M. C. Piccolo. 2003. Stable carbon isotope ratio and composition of microbial fatty acids in tropical soils. *Journal of Environmental Quality* 32: 198-206. (28 citations)
28. Varella, R. F., M. M. C. Bustamante, A. S. Pinto, K. W. Kisselle, R. V. Santos, R. A. Burke, R. G. Zepp, and L. T. Viana. 2004. Soil fluxes of CO₂, CO, NO, and N₂O from an old-pasture and from native savanna in Brazil. *Ecological Applications* 14(4) Supplement: S221-S331.
29. Pinto, A. S., M. M. C. Bustamante, M. R. da Silva, K. W. Kisselle, M. Brossard, R. Kruger, R. G. Zepp, and R. A. Burke. 2006. Effects of different treatments of pasture restoration on soil trace gas emissions in the Cerrados of Central Brazil. *Earth Interactions* 10: 1-26.
30. Ramirez-Alvarez, N., J. V. Macias-Zamora, R. A. Burke, and L. V. Rodriguez-Villanueva. 2007. Use of $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and carbon to nitrogen ratios to evaluate the impact of sewage derived particulate organic matter on the benthic communities of the Southern California Bight. *Environmental Toxicology and Chemistry* 26: 2332-2338.
31. Molinero, J. and R. A. Burke. 2009. Effects of land use on dissolved organic matter biogeochemistry in piedmont headwater streams of the Southeastern United States. *Hydrobiologia* 635: 289-308.
32. Fritz, K.M., S. Fulton, B.R. Johnson, C.D. Barton, J.D. Jack, D.A. Word, and R.A. Burke. 2010. Structural and functional characteristics of natural and constructed channels draining a reclaimed mountaintop removal and valley fill coal mine. *Journal of the North American Benthological Society* 29: 673-689.
33. Fritz, K.M., S. Fulton, B.R. Johnson, C.D. Barton, J.D. Jack, D.A. Word, and R.A. Burke. 2011. An assessment of cellulose filters as a standardized material for measuring litter breakdown in headwater streams. *Ecohydrology* 4: 469-476.
34. Viana, L.T., M.M.C Bustamante, M. Molina, A.S. Pinto, K. Kisselle, R. Zepp, and R.A. Burke. 2011. Microbial communities in Cerrado soils under native vegetation subjected to prescribed fire and under pasture. *Pesq. Agropec. Bras., Brasilia* 46: 1665-1672.

Peer-reviewed Book Chapters and Conference Proceedings Papers

1. Brooks, J. M., D. A. Wiesenburg, R. A. Burke, M. C. Kennicutt, and B. B. Bernard, 1980, Gaseous and volatile hydrocarbons in the Gulf of Mexico following the IXTOC-1 blowout, Proceedings of a Symposium on Preliminary Results from the September 1979 Researcher/Pierce IXTOC-1 cruise, Key Biscayne, FL, June 9-10, 1980, U. S. Dept. of Commerce, Boulder, CO, pp. 53-85.

2. Burke, R.A., W.M. Sackett and J.M. Brooks, 1986. Hydrogen- and carbon-isotope compositions of methane from DSDP Site 618, Orca Basin. In: A.H. Bouma, J.M. Coleman, A.W. Meyer et al. (eds.), *Initial Reports of the Deep Sea Drilling Project*, Vol. XCVI, U.S. Government Printing Office, Washington, D.C., pp. 777-780.
3. Burke, R.A. and W.M. Sackett, 1986. Stable hydrogen and carbon isotopic compositions of biogenic methanes from several shallow aquatic environments. In: M.L. Sohn (ed.), *Organic Marine Geochemistry*, ACS Symposium Series, No. 305, American Chemical Society, Washington, D.C. pp. 297-313.
4. Kennicutt, M.C., J.M. Brooks, and R.A. Burke, 1989. Hydrocarbon seepage, gas hydrates, and authigenic carbonate in the northwestern Gulf of Mexico. *Proceedings of the 1989 Offshore Technology Conference (OTC 5952)*, Houston, Texas, 649-654.
5. Burke, R. A., 1992. Factors responsible for variations in stable isotope ratios of microbial methane from shallow aquatic sediments. In: R. Vially, (ed.) *Bacterial Gas*, Éditions Technip, Paris, France, pp. 47-61.
6. Kennicutt, M.C. and R. A. Burke 1995. Stable Isotopes: Clues to biological cycling of elements at hydrothermal vents. In: D. M. Karl, Ed. *The Microbiology of Deep-Sea Hydrothermal Vents*, CRC Press, Boca Raton, FL, pp. 275-287.
7. Zepp, R.G., W.L. Miller, M.A. Tarr, R.A. Burke, D. Parsons, and M. Scholes, 1996. Dynamics of soil and vegetation emissions of carbon monoxide in a southern African savanna, In: J. Levine (Ed.) *Biomass Burning and Global Change: Volume 1, Remote Sensing, Modeling and Inventory Development, and Biomass Burning in Africa*, The MIT Press, Cambridge, MA, pp.381-388.
8. Levine, J.S., D. Parsons, R.G. Zepp, R.A. Burke, D.R. Cahoon, W.R. Cofer, W.L. Miller, M.C. Scholes, R.J. Scholes, D.I. Sebacher, S. Sebacher, and E.L. Winstead, 1997. Southern African savannas as a source of atmospheric gases. In: B. van Wilgen, M.O. Andreae, J. Goldammer, and J. Lindesay (Eds.) *Fire in Southern African Savannas*, Witwatersrand University Press, Johannesburg, South Africa, pp. 135-160 .
9. Burke, R. A. and J. Molinero. 2003. Trace gas concentrations in small streams of the Georgia Piedmont. In: K. J. Hatcher (Ed.) *Proceedings of the 2003 Georgia Water Resources Conference*, University of Georgia, Athens, GA, pp. 842-845.
10. Molinero, J. and R. A. Burke. 2003. Relations between land use and stream nutrient concentrations for small watersheds in the Georgia Piedmont. In: K. J. Hatcher (Ed.) *Proceedings of the 2003 Georgia Water Resources Conference*, University of Georgia, Athens, GA, pp. 821-824.
11. Burke, R. A. and J. Molinero. 2005. Organic waste contamination indicators in small

Georgia Piedmont streams. In: K. J. Hatcher (Ed.) Proceedings of the 2005 Georgia Water Resources Conference, University of Georgia, Athens, GA, pp. 529-532.

12. Burke, R. A. and J. Molinero. 2005. Nitrate and nitrous oxide concentrations in small streams of the Georgia Piedmont. In: R. Russo (Ed.) NATO/CCMS Pilot Study Final Report, NATO, pp. 79-84.

EPA Reports

Zepp, R. G. and R. A. Burke. 1998. Impacts of fire and solar ultraviolet radiation on trace gas exchange in the Boreal Forest Biome: A review. USEPA Environmental Research Brief, EPA/600/S-98/003, 7 pp.

Burke, R. A. and M. Molina. 2003. Indicators of global change impacts on aquatic ecosystem functioning in Southeastern US watersheds. EPA/600/S-03/003, 43 pp.

Funded Research Proposals

Hydrogen and Carbon Isotopic Compositions of Biogenic Methanes. W.M. Sackett, P.I. and R.A. Burke, Co-P.I. NSF 7/83 - 12/84. \$43,166.

Hydrogen Isotope Variations in Biogenic Methanes: Effects of Hydrate Formation/Decomposition and Fractionation from CO₂ Reduction, W.M. Sackett, P.I., and R.A. Burke, Co-PI, NSF, 1/85 to 12/86, \$99,474

Biogenic Methanes: Fluxes and Isotopic Compositions from Warm Wetland Environments. W.M. Sackett, P.I. and R.A. Burke, Co-P.I. NASA 10/85 - 12/88 at approx. \$75,000/yr.

Studies of Hydrocarbon Seep Communities on the Texas/Louisiana Continental Slope. J.M. Brooks, P.I., M.C. Kennicutt and R.A. Burke, Co-PI's, NOAA Sea Grant, 9/89 - 8/90, \$49,474.

Methane Emissions from Natural Wetlands, R.A. Burke, P.I., and D.L. Wilkinson, Co.-P.I., DOE NIGEC, 7/1/91 to 6/30/94, \$56,576 - Change of P.I. and institution to J. Meyer, P.I., and R.A. Burke, Co.-P.I. at Univ. of Georgia because of job change by R.A. Burke.

Polycyclic Aromatic Hydrocarbons as Probes of Fire-Climate Interactions, R. Zepp and R. Burke, Project Officers, EPA 2% Set Aside Program for Innovative Research, 10/92 - 9/93, \$50,000.

Soil/atmosphere Exchange of Methane from Natural and Agriculturally-impacted Riparian Wetlands, J. Meyer, P.I. and R. A. Burke, Co-P.I., DOE-NIGEC, 10/93 - 10/95, \$80,100.

Trace Gas Exchange in the Boreal Forest Biome: Effects of Fire and Beaver Activity. R.G. Zepp, P.I., R.A. Burke, J.S. Levine, W.R. Cofer, D.S. Ojima, W. J. Parton, B.J. Stocks, R.A.

Bourbonniere, M. A. Moran, and R.E. Hodson, Co-PIs. Boreal Ecosystem Atmosphere Study (BOREAS), funded by NASA and EPA 6/93 to 9/95, \$565,000

Use of Stable Carbon Isotope Ratios and Microbial Lipid Compositions to Study Soil Organic Matter Cycling in Terrestrial Ecosystems, R. A. Burke, P.I. and M. Molina, Co-PI, Competitive Internal Grants Program, USEPA, 10/96 - 9/99, approx. \$100,000 per year.

Impacts of Climatic and Human Stressors on Carbon and Nutrients in Soils of Amazonia, R. G. Zepp, P.I., R. A. Burke, Co-PI, and M. Molina, Co-PI., Competitive Internal Grants Program, USEPA, 7/98 - 6/01, \$375,000.

Impacts of Land Use Change on Nutrient and Carbon Cycles and Trace Gas Exchange in Soils of Savannas in Central Brazil, R. G. Zepp, P.I., R. A. Burke, Co-PI, M. Molina, Co-PI., and M. Bustamante, Co-PI., Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA), NASA, 7/98 - 6/01, \$170,000.

Effects of Land Use Changes on the Functioning of Soils and Watersheds of Central Brazil Savannas: Impacts on Nutrient and Carbon Cycles and Trace Gas Exchange, R. G. Zepp, P. I., R. A. Burke, Co-PI, M. Molina, Co-PI., M. Bustamante, Co-PI., A. Rosado, Co-PI, A. Cardosa, Co-PI, and D. Markewitz, Co-PI, Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Phase 2, NASA, 1/03 - 12/05, \$241,135.

Oral and Poster Presentations with Published Abstracts, Book Chapters, or Proceedings Papers

1. Burke, R.A., J.M. Brooks and W.M. Sackett. Light hydrocarbon geochemistry of Red Sea brines and sediments, presented at the Fall 1979 meeting of the American Geophysical Union, San Francisco, 3-7 December, 1979.
2. Burke, R.A., M. Brooks, G. Bodennec and D.F. Reid. Reduced gases in the Eastern Tropical North Pacific, presented at the Fall 1979 meeting of the American Geophysical Union, San Francisco, 3-7 December, 1979.
3. Burke, R.A. and W.M. Sackett. Hydrogen and carbon isotopic compositions of biogenic methanes, presented at the American Chemical Society National Meeting, 28 April - 3 May 1985, Miami, Florida.
4. Burke, R.A. Stable hydrogen and carbon isotopic compositions of biogenic methanes, presented at the Sixth Dissertations Symposium on Chemical Oceanography, Honolulu, Hawaii, 14-18 October 1985. **invited**
5. Burke, R.A., T.R. Barber and W.M. Sackett. Methane flux and stable isotopic compositions from shallow aquatic environments, presented at the American Chemical Society National Meeting, Denver, 5-10 April 1987.

6. Burke, R.A., W.M. Sackett and T.R. Barber. Stable hydrogen and carbon isotopic compositions of biogenic methane from shallow freshwater sediments, presented at the Spring 1987 AGU Meeting, Baltimore, 18-22 May 1987.
7. Burke, R.A. Stable isotope variations in methane from shallow aquatic environments, presented at the GSA Annual Meeting, Phoenix, 26-29 October 1987.
8. Burke, R.A. Stable isotope ratios of microbial methane from shallow aquatic sediments, presented at the Third Chemical Congress of North America/ACS National Meeting, Toronto, Canada, 5-10 June 1988.
9. Burke, R.A. Factors responsible for variations in stable isotope ratios of microbial methane from shallow aquatic sediments, presented at the Bacterial Gas Conference sponsored by International Union of Geological Sciences (IUGS)/AGIP/Institut Francais Petrole (IFP), Milano, Italy, 25-26 September 1989. **invited**
10. Burke, R.A., D. Withrow, J. Alcala-Herrera, and J.M. Brooks. Carbon isotope ratio variations in Bowhead whale baleen plates, presented at the AGU/ASLO National Meeting, New Orleans, LA, 12-16 February 1990.
11. Burke, R.A., J.M. Brooks, M.C. Kennicutt, and R.J. Taylor. Pore water geochemistry at Gulf of Mexico continental slope hydrocarbon seep sites, presented at the Geol. Assoc. of Canada/ Mineralogical Assoc. of Canada Joint Annual Meeting, Vancouver, Canada, 16-18 May 1990.
12. Burke, R.A., J.L. Meyer, K.M. Birkhead, and M.J. Paul. Exchange of methane between Southeastern U.S. forest and agricultural soils and the atmosphere, presented at the International Symposium on Soil Processes and Management Systems: Greenhouse Gas Emissions and Carbon Sequestration, Columbus, OH, April 5-9, 1993.
13. Burke, R.A., J.M. Meyer, and K.M. Birkhead. Methane exchange between mid-latitude hardwood forest and agricultural soils and the atmosphere, presented at the 1993 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6-10, 1993. **Invited**
14. Zepp, R.G., W.L. Miller, R.A. Burke, D.A.B. Parsons, and M.C. Scholes. Effects of moisture and burning on soil-air exchange of trace carbon gases in a southern African savanna, presented at the 1993 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6-10, 1993. **Invited**
15. O'Malley, V.P., R.A. Burke, and W.S. Schlottzhaur. Determination of the $^{13}\text{C}/^{12}\text{C}$ ratio of individual hydrocarbons produced from the pyrolysis of biomass materials using GC-MS/C/IRMS, presented at the 1995 American Chemical Society National Meeting, Chicago, August 20-24, 1995.

16. Burke, R.A., M.A. Tarr, W.L. Miller, and R.G. Zepp. Effect of fire on soil-atmosphere exchange of methane and carbon dioxide in a Canadian Boreal forest during BOREAS '94, presented at the 1995 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 30 - June 2, 1995. **Invited**
17. Tarr, M.A., W.L. Miller, R.A. Burke, and R.G. Zepp. Effect of fire on soil-atmosphere exchange of carbon monoxide in a Canadian Boreal forest during BOREAS '94, presented at the 1995 Spring Meeting of the American Geophysical Union, Baltimore, MD, May 30 - June 2, 1995. **Invited**
18. Burke, R.A. and R. G. Zepp. Effects of disturbance on soil respiration, presented at the 1997 Soil Science Society of America National Meeting, Anaheim, CA, October 26 - 30, 1997.
19. Burke, R.A., R.G. Zepp, M.A. Tarr, and W.L. Miller. Soil-Atmosphere exchange of methane and carbon dioxide in Canadian Boreal forest sites, presented at the 1997 Society for Environmental Toxicology and Chemistry Annual Meeting, San Francisco, CA, November 16 -20, 1997. **invited**
20. Burke, R.A., M. Molina, J. E. Cox, and L. J. Osher. Effects of land use on the composition and stable carbon isotopic ratio of bacterial fatty acids, presented at the 1998 Soil Science Society of America National Meeting, Baltimore, MD, October 19 - 22, 1998.
21. Burke R.A., M. Molina, J.E. Cox, and L.J. Osher. Use of the composition and stable carbon isotope ratio of microbial fatty acids to study carbon cycling, presented at the Southeastern section of the Geological Society of America Symposium, Athens, GA, March 24-26, 1999.
22. Burke, R.A., M. Molina, and J.E. Cox. Use of stable carbon isotope ratios of fatty acids to evaluate microbial carbon sources in terrestrial environments, presented at the 1999 Soil Science Society of America National Meeting, Salt Lake City, UT, November 1-4, 1999.
23. Molina, M., R.A. Burke, and J.E. Cox. Effect of temperature on the C isotopic value of microbial lipids applied to determine C usage in microbial communities, presented at the American Society for Microbiology Annual Meeting, Los Angeles, CA, May 21-25, 2000.
24. Pinto, A., R. Varella, G. Nardoto, L. Viana, L. Andrade, R. Chiba, R. Santos, M. Bustamante, R. A. Burke, M. Molina, R.G. Zepp, K. Kisselle, and S.P. Opsahl. Impacts of land use change and fire on nutrient and carbon cycles and trace gas exchange in soils of the cerrado in central Brazil, presented at the First Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Scientific Conference, Belem, Brazil, June 26-30, 2000.

25. Pinto, A., R. Varella, G. Nardoto, L. Viana, L. Andrade, R. Chiba, R. Santos, M. Bustamante, R.A. Burke, K. Kisselle, M. Molina, and R.G. Zepp. Interactions of nutrient and carbon cycles and trace gas exchange with land use change and fire in the Cerrado of Central Brazil, presented at the Fall 2000 American Geophysical Union Annual Meeting, San Francisco, CA, December 15-19, 2000. **Invited**
26. Bustamante, M., A. Pinto, L. Viana, G. Nardoto, R.G. Zepp, R.A. Burke, M. Molina, and K. Kisselle. Effects of prescribed fires on nitrogen fluxes in savanna formations of central Brazil, presented at the Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Open Meeting, Atlanta, GA, February 12-14, 2001.
27. Pinto, A., M. Bustamante, L. Viana, R.G. Zepp, R.A. Burke, M. Molina, and K. Kisselle. Soil emissions of CO₂ and CO in tropical savannas of central Brazil under different fire regimes, presented at the Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA) Open Meeting, Atlanta, GA, February 12-14, 2001.
28. Burke, R.A. Use of GC-MS/Combustion/IRMS to identify and determine the stable carbon isotopic ratio of individual lipids, presented at the 2001 American Chemical Society Annual Meeting, San Diego, CA, April 1-5, 2001. **invited**
29. Kisselle, K., R.G. Zepp, R.A. Burke, A. Pinto, and M. Bustamante. Photochemical effects on NO_x and CO emissions in a Brazilian savanna, presented at the Ecological Society of America Meeting, Madison, WI, August 5-10, 2001.
30. Burke, R.A. and M. Molina. Effects of land use on microbial community composition and carbon source, presented at the 2001 Soil Science Society of America National Meeting, Charlotte, NC, October 22 - 25, 2001.
31. Burke, R.A. and M. Molina. Use of fatty acid stable carbon isotope ratio to indicate microbial carbon source in tropical soils, presented at the 3rd International Conference on Application of Stable Isotope Techniques to Ecological Studies, Flagstaff, AZ, April 28 - May 1, 2002.
32. Molina, M. and R.A. Burke. ¹³C-depleted microbial lipids indicate seasonal methanotrophic activity in shallow estuarine sediments, presented at American Society of Limnology and Oceanography Conference, Victoria, Canada, June 10-14, 2002.
33. Kisselle, K., R.G. Zepp, R.A. Burke, A. Pinto, and M. Bustamante. NO_x and CO emissions from soil and surface litter in a Brazilian savanna, presented at the 2nd Science Conference for the Large Scale Biosphere-Atmosphere Experiment in Amazonia (LBA), Manaus, Brazil, July 7-10, 2002.
34. Pinto, A., M. Bustamante, R. Zepp, R. Burke, K. Kisselle, L. Viana, C. Garofalo, and M. Molina. Effects of different pasture management on emissions of soil trace gases (N₂O, NO and CO₂), presented at the 2nd Science Conference for the Large Scale Biosphere-

Atmosphere Experiment in Amazonia (LBA), Manaus, Brazil, July 7-10, 2002.

35. Molinero, J. and R.A. Burke. Assessing non-point sources of nitrogen to small streams in the South Fork Broad River watershed (Georgia, USA), presented at VII International Congress of Ecology, Seoul, Korea, August 11-18, 2002.
36. Burke, R.A. and J. Molinero. Nitrous oxide concentrations in small streams of the Georgia Piedmont, presented at the American Society of Agronomy-Crop Science Society of America-Soil Science Society of America Annual Meeting, Indianapolis, IN, November 10-14, 2002.
37. Zepp, R.G., R.A. Burke, M. Molina, M. Bustamante, D. Markewitz, A. Cardoso, and A. Rosado. Effects of land use changes on the functioning of soils and watersheds of central Brazil savannas: Impacts on nutrient and carbon cycles and trace gas exchange, presented at the 6th LBA-ECO Science Team Meeting, San Francisco, CA, December 11-13, 2002.
38. Kisselle, K., R.G. Zepp, M. Molina, R.A. Burke, and A.J. Franzluebbers. Effects of fertilizer type (chicken litter vs. inorganic fertilizer) and cattle grazing on the soil microbial community, presented at the 2003 Annual Symposium: Soil Biodiversity and Function, Lancaster, UK, March 25-27, 2003.
39. Burke, R.A. and J. Molinero. Trace gas concentrations in streams - Early warning indicators of stream impairment?, presented at the USEPA Science Forum 2003, Washington, DC, May 5-7, 2003.
40. Burke, R.A. and J. Molinero. Trace gas concentrations in Georgia Piedmont headwater streams, presented at the 2003 Annual Meeting of the North American Benthological Society, Athens, GA, May 27-31, 2003.
41. Molinero, J. and R.A. Burke. Dissolved organic carbon (DOC) concentrations in small streams of the Georgia Piedmont, presented at the 2003 Annual Meeting of the North American Benthological Society, Athens, GA, May 27-31, 2003.
42. Burke, R.A. and M. Molina. Fatty acid stable isotope indicators of microbial carbon source in tropical soil, presented at the 2003 Soil Science Society of America Annual Meeting, Denver, CO, November 2-6, 2003. **Invited**
43. Pinto, A.S., M.M.C. Bustamante, R. Zepp, K. Kisselle, M. Brossard, and R. Burke. Trace gas emissions (NO, N₂O, and CO₂) in managed pasture soils of the Brazilian Savanna, presented at the 7th LBA-ECO Science Team Meeting, Fortaleza, Ceara, Brazil, November 5-8, 2003.
44. Burke, R.A. and J. Molinero. Biogeochemical indicators of organic waste contamination in small streams of the Georgia Piedmont, presented at the 2004 EMAP Symposium, Newport, RI, May 3-7, 2004.

45. Molina, M., L. Viana, R.A. Burke, M. Bustamante, and R.G. Zepp. Effect of management practices on the soil microbial community in agricultural and native systems in Brazil, presented at American Society for Microbiology Annual Meeting, New Orleans, LA, May 23-27, 2004.
46. Molina, M., R.A. Burke and J. Molinero. Response of sedimentary microbial communities to different land use practices affecting headwater streams in Georgia, presented at American Society of Limnology and Oceanography 2004 Summer Meeting, Savannah, GA, June 13-18, 2004.
47. Kisselle, K.W., R.G. Zepp, R.A. Burke, M. Molina, and M. Bustamante. NO_x and CO emissions from cerrado plant litter, presented at LBA Science Meeting, Brasilia, Brazil, July 26-28, 2004.
48. Burke, R.A., M. Molina, J. E. Cox, P. A. Stuedler, and C. C. Cerri. Stable carbon isotope ratio and composition of microbial fatty acids in Rondonia pasture and forest soils, presented at the Second Workshop on Biogeochemical Changes Associated with Agroecosystems, Third LBA Scientific Conference, Brasilia, Brazil, July 25-26, 2004.
invited
49. Burke, R.A. and J. Molinero. Biogeochemical indicators of organic waste contamination in Georgia Piedmont Streams, presented at the 2004 Soil Science Society of America Annual Meeting, Seattle, WA, October 31 - November 4, 2004.
50. Burke, R.A. and J. Molinero. Organic waste contamination indicators in small Georgia Piedmont streams, presented at the 2005 Georgia Water Resources Conference, Athens, GA, April 25-27, 2005.
51. Zepp, R.G., R.A. burke, M. Molina, K. Kisselle, M. Bustamante, A. Kozovits, and A. Pinto. The LBA Project: Nutrient cycles and trace gas exchange in savannas of central Brazil. Presented at the EPA Science Forum 2005, Washington, DC, May 16 - 18, 2005.
52. Burke, R.A. and J. Molinero. Potential impact of organic wastes on small stream water quality, presented at the 2005 American Geophysical Union/ North American Benthological Society Annual Meeting, New Orleans, LA, May 23-27, 2005.
53. Burke, R.A., J. Molinero, D. Spidle, and L. Prieto. Nutrient concentrations in flowing waters of the South Fork Broad River, Georgia watershed, presented at the EPA Office of Water Mississippi River Basin Nutrients Science Workshop, St. Louis, MO, October 4-6, 2005.
54. Fritz, K.M., B.R. Johnson, R.A. Burke, P.J. Wigington Jr, B.H. Hill, C.T. Nietch, and R.J. Bruins. Establishing the importance of headwater streams: Concepts and preliminary applications, presented at headwaters workgroup, AWRA Meeting, Seattle, WA,

November 09, 2005.

55. Silva, J.S., V. Miranda, R. Burke, R. Zepp, D. Markewitz, and M. Bustamante. Effects of land use changes on the chemistry of small streams in the Cerrado region, presented at the 9th LBA-ECO Science Team Meeting, Sao Paulo, SP, Brazil, November 10-12, 2005.
56. Burke, R.A., S. Fulton, K. Fritz, B. Johnson, and C. Barton. Effects of mountaintop mining/valley fill (MTM/VF) on functional indicators in Appalachian headwater streams, presented at the EPA Regional Science Workshop on Headwaters and Associated Wetlands in the Mid-Atlantic Highlands Region, Philadelphia, PA, June 20-21, 2006.
57. Burke, R.A. J. Molinero, D. Spidle, and L. Prieto. Nutrient concentrations in flowing waters of the South Fork Broad River, Georgia watershed, presented at the EPA Regional Science Workshop on Headwaters and Associated Wetlands in the Mid-Atlantic Highlands Region, Philadelphia, PA, June 20-21, 2006.
58. Castro-Morales, K. C., J. V. Macias- Zamora, and R. A. Burke. Dissolved Methane in the Sills Area, Gulf of California, Mexico. Presented at Workshop on Oxygen Minimum Systems in the Ocean: Distribution, Diversity and Dynamics, Concepcion, CHILE, October 24 - 26, 2006.
59. Fritz, K.M., S. Fulton, B.R. Johnson, C. Barton, J. Jack, D. Word, and R.A. Burke. Do post-mining constructed channels replace functional attributes of headwater streams?, presented at the North American Benthological Society Annual Meeting, Columbia, SC, June 3-7, 2007.
60. Burke, R.A. and J. Molinero. Dissolved organic carbon and dissolved carbon dioxide concentrations and export in Georgia Piedmont headwater streams, presented at the Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry, New London, NH, July 8-13, 2007.
61. Silva, J.S., D. Markewitz, M. Bustamante, and R. Burke. Land use impacts on stream water quality in the Brazillian Cerrado, presented at the 11th LBA-ECO Science Team Meeting, Salvador, Bahia, Brazil, September 26-27, 2007.
62. Fritz, K.M., S. Fulton, B.R. Johnson, C. Barton, J. Jack, D. Word, and R.A. Burke. Do post-mining constructed channels replace functional attributes of headwater streams?, presented at the Mid-Atlantic Stream Restoration Conference, Cumberland, MD, November 7-8, 2007.
63. Burke, R.A., K.M. Fritz, B.R. Johnson, S. Fulton, and C. Barton. Relationship between watershed land use and denitrification enzyme activity in headwater streams, presented at the Denitrification Research Coordination Network Workshop, Cambridge, MD, May 27-30, 2008.

64. Burke, R.A., K.M. Fritz, B.R. Johnson, S. Fulton, and C. Barton. Impact of mountaintop mining/valley fill on the stable carbon isotopic composition and concentration of dissolved organic carbon and dissolved inorganic carbon in headwater streams, presented at the 6th International Conference on Applications of Stable Isotope Techniques to Ecological Studies, Honolulu, HI, August 25-29, 2008.
65. Burke, R.A. Influence of land use on the stable carbon isotopic composition and concentration of dissolved organic carbon and dissolved inorganic carbon in Georgia Piedmont headwater streams, presented at the Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry, Andover, NH, July 12-17, 2009.
66. Macias-Zamora, J.V., K. Castro-Morales, R.A. Burke, and F. Saro-Rivera. Oceanic methane concentrations in three Mexican regions, presented at the First Mexican Carbon Symposium, Ensenada, Baja California, Mexico, October 7-9, 2009.
67. Burke, R.A. Effects of land use on the stable carbon isotopic composition and concentration of dissolved organic carbon (DOC) and dissolved inorganic carbon (DIC) in Southeastern US Piedmont headwater streams, presented at the 2010 Summer Meeting: A Joint Meeting of ASLO and NABS, Santa Fe, NM, June 6-11, 2010.
68. Burke, R.A., M.B. McCranie, and M.A. Stanley. Influence of land use and in-stream parameters on denitrification enzyme activity in southeastern US piedmont headwater stream, presented at the Aquatic Sciences Meeting of the American Society of Limnology and Oceanography, San Juan, P.R., February 13-18, 2011.

Other Oral Presentations

1. Burke, R.A. Processes that affect the stable isotopic composition of methane, presented at the EPA/AERL All-Investigators Workshop, Athens, GA, February 1992.
2. Burke, R.A. Soil-atmosphere methane exchange at the Horseshoe Bend Agricultural Experimental Site, presented at the UGA Institute of Ecology, Athens, GA, July 24, 1992.
3. Burke, R.A. Methane fluxes from temperate riparian and agricultural ecosystems, presented at the EPA/AERL All-Investigators Workshop, Athens, GA, March 16-18, 1993.
4. Burke, R.A. Soil-atmosphere exchange and trace gas emissions from biomass burning, presented at the EPA/AERL Meeting on the Scientific Requirements of Earth System Modeling, Athens GA, July 13-14, 1993.
5. Burke, R.A. Use of stable isotope ratios of fatty acids to evaluate microbial carbon sources in terrestrial environments, seminar presented at the Centro de Energia Nuclear na Agricultura (CENA) of the University of Sao Paulo, Piracicaba, Brazil, September 16,

1999. **invited**

6. Burke, R.A. Use of the composition and stable carbon isotope ratio of microbial fatty acids to study carbon cycling, seminar presented to the Department of Ecology of the University of Brasilia, Brazil, November 6, 2000. **invited**
7. Burke, R.A. Use of GC-MS/Combustion/IRMS to identify and determine the stable carbon isotopic ratio of individual lipids, seminar presented at the Instituto de Investigaciones Oceanológicas of the Universidad Autónoma de Baja California, October 12, 2001. **invited**
8. Burke, R.A. Trace gas and nutrient concentrations in small streams of the Georgia Piedmont, seminar presented to the Department of Ecology of the University of Brasilia, Brazil, May 16, 2003. **invited**
9. Burke, R.A. Trace gas and nutrient concentrations in small streams of the Georgia Piedmont, seminar presented at the Instituto de Investigaciones Oceanológicas of the Universidad Autónoma de Baja California, June 6, 2003. **invited**
10. Burke, R.A. Trace gas and nutrient concentrations in small streams of the Georgia Piedmont, seminar presented at the Joseph W. Jones Ecological Research Center, August 21, 2003. **invited**
11. Burke, R.A. Biogeochemical indicators in small Piedmont streams, seminar presented to EPA Region 8 scientific staff, Denver, Co, November 4, 2003.
12. Burke, R.A. Effects of watershed disturbance on small streams, presented to the Georgia College and State University Environmental Science Club, Milledgeville, GA, April 3, 2006.
13. Ambrose, R. B., R.A. Burke, W.E. Frick, E.J. Hayter, J.M. Johnston, S.R. Kraemer, J.W. Washington, B.R. Faulkner, M.M. Hantush, P.M. Mayer, and E.A. Striz. Water quality modeling research. presented at Water Quality BOSC Review, Cincinnati, OH, January 23 - 25, 2006.

Cruise and Other Field Experience

Eighteen oceanographic research cruises totaling about 175 days including two cruises of several days duration each in the U.S. Navy nuclear submarine *NR-1*, two dives in the research submersible *Pisces II*, two dives in the research submersible *Johnson Sea Link*, and one dive in the research submersible *ALVIN*. Approximately 35 field sampling expeditions totaling about 250 days to various terrestrial environments for the purpose of measuring soil/atmosphere trace gas exchange, collecting stream samples, and collecting soil samples for stable isotopic analyses.

